

Ruofei Du

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- CAREER GOAL** I devote to inventing future interactive technologies in 3D graphics, fusing the information from the physical and virtual worlds, and making it interactive, accessible, and useful in VR, AR, and MR.
- EDUCATION**
- University of Maryland**, College Park, Maryland, USA Sep. 2013 - Dec. 2018
Ph.D. and M.S. in Computer Science, GPA: 3.9 / 4.0. Advisor: Prof. Amitabh Varshney
Dissertation: Fusing Multimedia Data Into Dynamic Virtual Environments
- ACM Honored Class, Shanghai Jiao Tong University**, China Sep. 2009 - Jul. 2013
B.S. in Computer Science. GPA: 88.0 / 100.0. Advisor: Prof. Bao-Liang Lu
Thesis: Research on Fatigue Driving Detection System Based on Video Signals
- RESEARCH EXPERIENCE**
- Research Scientist at Google, San Francisco** Jan. 2019 - Present
- Research areas: virtual and augmented reality, interactive 3D graphics.
- Research Intern at Microsoft AI+Research, Redmond (MSR)** May – Aug. 2017
- Developed and published two papers on Montage4D for fusing multiview videos in real time.
- Research Intern at Microsoft Research, Redmond (MSR)** May – Aug. 2016
- Collaborated on Mobile Holoportation, demoed to Microsoft CEO, and filed a US patent.
- Research Assistant at UMIACS** Aug. 2013 – Dec. 2018
- Led the development of Geollery.com, a mixed reality social platform (ACM CHI 2019).
 - **Best Paper Award** for SocialStreetView.com at ACM Web3D 2016, Anaheim, California.
 - **Best Poster Award** for Spherical Harmonics for real-time saliency computation in 360° videos.
 - HandSight: Real-time text-to-speech with finger-mounted camera for *the blind people*.
- Research Intern at Microsoft Research Asia (MSRA)** Jul. 2012 - Feb. 2013
- 3DVAR: Developed a real-time 3D reconstruction system and won a **Best Demo Award**.
- Center for Brain-like Computing and Machine Intelligence (BCMI)** Jul. 2011 - Jul. 2013
- **Second Prize Award** on the China International Industry Fair (CIIF) in November, 2011.
- PEER-REVIEWED PUBLICATIONS**
- [21] Xiaoxu Meng, **Ruofei Du**, Amitabh Varshney. *Eye-dominance-guided Foveated Rendering*. Conditionally accepted in IEEE Transaction on Visualization and Computer Graphics (TVCG), Special Issue on Virtual Reality (IEEE VR), 2020.
- [20] Changqing Zou, Haoran Mo, Chengying Gao, **Ruofei Du**, Hongbo Fu. *Language-based Colorization of Scene Sketches*. ACM Transaction on Graphics (SIGGRAPH Asia), Vol. 38, No. 6, Article 233, 2019.
- [19] **Ruofei Du**, David Li, and Amitabh Varshney. *Geollery: A Mixed Reality Social Media Platform*. Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems, 2019.
- [18] **Ruofei Du**, Ming Chuang, Wayne Chang, Hugues Hoppe, and Amitabh Varshney. *Montage4D: Real-Time Seamless Fusion and Stylization of Multiview Video Textures*. Journal of Computer Graphics Techniques (JCGT), 8(1), 2019.

- [17] Yue Jiang, **Ruofei Du**, Christof Lutteroth, and Wolfgang Stuerzlinger. *ORC Layout: Adaptive GUI Layout with OR-Constraints*. Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems, 2019.
- [16] **Ruofei Du**, David Li, and Amitabh Varshney. *Project Geollery.com: Reconstructing a Live Mirrored World with Geotagged Social Media*. The 24th International ACM Conference on 3D Web Technology, 2019.
- [15] **Ruofei Du**, David Li, and Amitabh Varshney. *Experiencing a Mirrored World With Geotagged Social Media in Geollery*. Extended Abstracts of the CHI Conference on Human Factors in Computing Systems, 2019.
- [14] **Ruofei Du**, David Li, and Amitabh Varshney. *Interactive Fusion of 360° Images for a Mirrored World*. The 26th IEEE Conference on Virtual Reality and 3D User Interfaces, 2019.
- [13] **Ruofei Du**, Eric Lee, and Amitabh Varshney. *Tracking-Tolerant Visual Cryptography*. The 26th IEEE Conference on Virtual Reality and 3D User Interfaces, 2019.
- [12] **Ruofei Du**, Ming Chuang, Wayne Chang, Hugues Hoppe, and Amitabh Varshney. *Montage4D: Interactive Seamless Fusion of Multiview Video Textures*. Proceedings of the 2018 ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games (I3D), 2018.
- [11] Xiaoxu Meng, **Ruofei Du**, Matthias Zwicker, and Amitabh Varshney. *Kernel Foveated Rendering*. Proceedings of the ACM on Computer Graphics and Interactive Techniques, 1(5), 2018.
- [10] Changqing Zou, Qian Yu, **Ruofei Du**, Haoran Mo, Yi-Zhe Song, Tao Xiang, Chengying Gao, Baoquan Chen, and Hao Zhang. *SketchyScene: Richly-Annotated Scene Sketches*. Proceedings of European Conference on Computer Vision (ECCV), 2018.
- [9] Changqing Zou, Haoran Mo, Chengying Gao, **Ruofei Du**, Hongbo Fu. *LUCSS: Language-Based User-Customized Colourization of Scene Sketches*. arXiv:1808.10544, 2018.
- [8] **Ruofei Du** and Amitabh Varshney. *Social Street View: Blending Immersive Street Views with Geo-tagged Social Media*. The 21st Annual International Conference on 3D Web Technology, 2016. **Best Paper Award**.
- [7] **Ruofei Du**, Sujal Bista, and Amitabh Varshney. *Video Fields: Fusing Multiple Surveillance Videos into a Dynamic Virtual Environment*. The 21st Annual International Conference on 3D Web Technology, 2016.
- [6] Lee Stearns, **Ruofei Du**, Uran Oh, Catherine Jou, Leah Findlater, David A. Ross, and Jon E. Froehlich. *Evaluating Haptic and Auditory Directional Guidance to Assist Blind Persons in Reading Printed Text Using Finger-Mounted Cameras*. In ACM Transactions on Accessible Computing, 8(5), 2016.
- [5] **Ruofei Du** and Liang He. *VRSurus: Enhancing Interactivity and Tangibility of Puppets in Virtual Reality*. Proceedings of the 2016 CHI Conference Extended Abstracts on Human Factors in Computing Systems, 2016.
- [4] **Ruofei Du**, Kent R. Wills, Max Potasznik, and Jon E. Froehlich. *AtmoSPHERE: Representing Space and Movement Using Sand Traces in an Interactive Zen Garden*. Proceedings of the 2015 CHI Conference Extended Abstracts on Human Factors in Computing Systems.
- [3] Leah Findlater, Lee Stearns, **Ruofei Du**, Uran Oh, David Ross, Rama Chellappa, and Jon E.

Froehlich. *Supporting Everyday Activities for Persons With Visual Impairments Through Computer Vision*. In Proceedings of the 17th International ACM SIGACCESS Conference on Computers & Accessibility, 2015.

[2] Lee Stearns, **Ruofei Du**, Uran Oh, Yumeng Wang, Leah Findlater, Rama Chellappa, and Jon E. Froehlich. *The Design and Preliminary Evaluation of a Finger-Mounted Camera and Feedback System to Enable Reading of Printed Text for the Blind*. In Proceeding of the European Conference on Computer Vision (ECCV) 2014 Workshops, 2014.

[1] **Ruofei Du**, Renjie Liu, Tianxiang Wu, and Bao-Liang Lu. *Online Vigilance Analysis Combining Video and Electrooculography Features*. Neural Information Processing - 19th International Conference, 2012.

PATENTS

- **Du, R.**, Varshney, A. *System and Methods for Generating A Social Street View*. US Patent 15/559,955. Granted. Priority date: March 20, 2015.
- **Du, R.**, Chang, W., Cutler, B. *Fusing, Texturing, and Rendering Views of Dynamic Three-Dimensional Models*. US Patent 15/863,799. Filed.
- **Du, R.**, Varshney, A. *System and Methods for Rendering Virtual Environments for Social Interaction*. US Provisional Patent 62/788,577. Filed.

HONORS AND AWARDS

Best Paper Award at the 21st International Conference on 3D Web Technology. Aug. 2016
Best Student Poster Award for spherical harmonics saliency at ACM I3D 2018. May. 2018
Volunteer Star Award for Excellent Service in the World EXPO 2010. Oct. 2010
Bronze Medalist in Asia-Pacific Informatics Olympiad (APIO 2008) Apr. 2008
Bronze Medalist in Chinese Team Selection Contest in Informatics (CTSC 2008) Apr. 2008
Bronze Medalist in Nation Olympiad in Informatics (NOI 2008) Aug. 2008
First Prizes & Top 3 in Nation Olympiad in Informatics in Province (NOIP) 2005-2007

PROFESSIONAL SERVICES

- Associate Chair on the Late Breaking Work committee of ACM CHI 2020.
- Chair for the "Augmented and Virtual Reality" session at ACM Web3D 2019.
- Chair for the "Making the Virtual Physical" session at ACM CHI 2019.
- Reviewer for over 100 journals and conference papers:
ACM CHI 2013–2020, ACM SIGGRAPH 2018, ACM SIGGRAPH Asia 2018–2019, ACM UIST 2015, 2018–2019, ACM Mobile HCI 2015–2018, ACM CSCW 2018–2019, ACM ICMI 2019, ACM DIS 2018–2019, ACM IDC 2015–2016, ACM C&C 2015, ACM CHI Play 2015; IEEE InfoVis and VAST 2018–2020, IEEE ISMAR 2015–2019, IEEE Virtual Reality and 3D User Interface 2018–2019; Graphical Interface 2016, 2019; CAD & Graphics 2017; EuroVis 2019.
- Student Volunteer: ACM CHI 2014, Toronto, Canada.

SUPERVISION AND TEACHING

- Xiaoxu Meng (UMD Ph.D. Candidate)
- David Li (UMD Ph.D. Student)
- Mukul Agarwal (UMD M.S.)
- Akanksha Shrivastava (UMD M.S.)
- Corey Ferrick (UMD B.S.)
- Naeem Alam, Teddy Corrales, Erin Estes, Erick Guzman, Kevin Ho, Austin Hom, Mughil Muthupari, Justin Pan, Justin Shen (Gemstone Project, Undergraduate Thesis Proposal Committee)
- Teaching Lead for Data Structures (CMSC 420) and Computer Architecture (CMSC 411).
- Teaching Assistant for Data Structures and Algorithms (CS 484) and Object Oriented Programming I-II (CMSC 131-132).

MEDIA COVERAGE

- Science X May 7, 2019.
New open source software eases the pain of multiple UI designs (Project ORC Layout)

- University of Maryland Institute for Advanced Computer Studies. January 2, 2019.
Augmentarium Alumnus Imagines an Immersive World (Project Geollery)
- Division of Research, University of Maryland. March 30, 2017.
UMD Researchers Create Affordable Camera Array That Captures Light Fields for Virtual Reality
- Big Ten Network. October 13, 2017.
How Maryland Researchers Are Improving Reading For The Visually Impaired.
- TERP Magazine. June 9, 2017.
A New Way With Words
- WUSA9. June 15, 2017.
UMD Researchers Hope To Help The Blind 'Experience the World'
- Futurism. November 15, 2016.
This New Tech Is Letting Blind People Read Without Braille
- PSFK. November 15, 2016.
Fingertip Cameras May Help The Blind Read Without Braille
- PC Magazine. November 10, 2016.
Fingertip Camera Reads to the Blind
- New Scientist. November 10, 2016.
Tiny Fingertip Camera Helps Blind People Read Without Braille
- University of Maryland Institute for Advanced Computer Studies. August 5, 2016.
Varshney and Graduate Student Du Win Best Paper Award at 2016 Web3D Conference
- University of Maryland, College Park. July 28, 2015.
CompSci Connect Students Present Projects, Explore Virtual and Augmented Reality
- Microsoft Research Asia. January 17, 2013.
Finding Insights in Diverse Networks (Project UISTViz)
- The Seattle Times. March 5, 2013.
TechFest Gives Glimpse of Microsofts Future (Project 3DVAR)
- Microsoft Research Asia. January 17, 2013.
Champion Demo at Student TechFest (In Chinese) (Project 3DVAR)
- Shanghai Jiao Tong University News May 30 2011.
Lab Inspection by The Ministry of Education in China. (In Chinese) (Project 3DEye)

PRESENTATIONS

- Project Geollery.com: Reconstructing a LiveMirrored World with Geotagged Social Media.
ACM Web3D 2019. Los Angeles, CA. July 27, 2019.
- Geollery: A Mixed Reality Social Media Platform.
ACM CHI 2019. Glasgow, UK. May 19, 2019.
- Experiencing a Mirrored World With Geotagged Social Media in Geollery.
ACM CHI 2019. Glasgow, UK. May 19, 2019.
- Interactive Fusion of 360 Images for a Mirrored World.
IEEE VR 2019. Osaka, Japan. March 25, 2019.
- Tracking-Tolerant Visual Cryptography
IEEE VR 2019. Osaka, Japan. March 25, 2019.
- Fusing Multimedia Data Into Dynamic Virtual Environments.
Ph.D. Dissertation, University of Maryland, College Park. October 19, 2018.
- Fusing Multimedia Data Into Dynamic Virtual Environments.
Facebook Reality Labs, Redmond, WA, USA. November 7, 2018.
- Fusing Multimedia Data Into Dynamic Virtual Environments.
Google, Mountain View, CA, USA. September 21, 2018.
- Montage4D: Interactive Seamless Fusion of Multiview Video Textures.
ACM I3D 2018, Montreal, Quebec, Canada. May 17, 2018.
- A Pilot Study of Spherical Harmonics for Saliency Computation and Navigation in 360° Videos.
ACM I3D 2018, Montreal, Quebec, Canada. May 16, 2018.
- Improving the Visual Quality of Mobile Holoportation.
Microsoft Research, Redmond, WA. August 18, 2017.
- VRSurus: Enhancing Interactivity and Tangibility of Puppets in Virtual Reality.

ACM CHI 2016, San Jose, CA, USA. May 7-12, 2016.

- **AtmoSPHERE: Representing Space and Movement Using Sand Traces in an Interactive Zen Garden.** *ACM CHI 2015, Seoul, Korea. April 18-23, 2015.*
- **Social Street View: Blending Immersive Street Views with Geo-tagged Social Media.** *SIGGRAPH Web3D 2016, Anaheim, CA. July 23, 2016. Best Paper Award.*
- **Video Fields: Fusing Multiple Surveillance Videos into Dynamic Virtual Environments.** *SIGGRAPH Web3D 2016 Anaheim, CA. July 24, 2016.*

SKILLS

- Programming: C++, C, Python, Java, PHP, JavaScript, SQL, C#, and Objective-C.
- Visual Computing: CUDA, GLSL, HLSL, OpenGL, OpenCV, TensorFlow, and Unity.
- Domain Knowledge: Computer Graphics, Computer Vision, Computational Geometry, Human-Computer Interaction, GPU Algorithms, Social Media, Chatbot, and Information Visualization.

OPEN SOURCED SOFTWARE

- **DuEngine: an efficient and interactive C++ graphics engine.**
<https://github.com/ruofeidu/DuEngine>
- **Language-based Colorization of Scene Sketches.**
<https://github.com/SketchyScene/SketchySceneColorization>
- **SketchyScene: Richly-Annotated Scene Sketches.**
<https://github.com/SketchyScene/SketchyScene>
- **VRSurus: Enhancing Interactivity and Tangibility of Puppets in Virtual Reality.**
<https://github.com/ruofeidu/VRSurus>
- **SketchyScene: Richly-Annotated Scene Sketches.**
<https://github.com/SketchyScene/SketchyScene>
- **HandSight: An iPad prototype for evaluating using finger-mounted camera with vibration feedback system to enable reading of printed text for people with visual impairments.**
<https://github.com/ruofeidu/HandSight>

REFERENCES

- Dr. Shahram Izadi
Director of Research and Engineering, Google LLC, USA.
- Dr. David Kim
Research Scientist and Manager, Google LLC, USA.
- Dr. Hugues Hoppe
Principle Research Scientist, Google LLC, USA.
- Dr. Amitabh Varshney
Dean of the College of Computer, Mathematical and Natural Sciences and Professor of Computer Science, University of Maryland, College Park, MD, USA.
- Dr. Norm Whitaker
Distinguished Scientist and Managing Director, Microsoft Research, Redmond, WA, USA.
- Dr. Wolfgang Steurzlinger
Professor at the School of Interactive Arts and Technology, Simon Fraser University, Vancouver, Canada.
- Dr. Baoquan Chen
Professor at the School of Electrical Engineering and Computer Science and Director of the Center on Frontiers of Computing Studies, Peking University, Beijing, China.
- Dr. Timo Ojala
Professor and Director of Center of Ubiquitous Computing, Faculty of Information Technology and Electrical Engineering, University of Oulu, Finland.
- Dr. Bao-Liang Lu
Professor at the Department of Computer Science and Engineering, Shanghai Jiao Tong University, China.